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Working environment interventions – Bridging the gap between policy instruments and practice

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ABSTRACT

In spite of progress in intervention research, our understanding of the transformation of knowledge from the research into national working environment programmes is limited. Research in state regulation is mainly aimed at compliance and efficiency of public administration, while little attention is paid to why and how public and private organisations subsequently are to improve their working environment. This paper suggests a model which can bridge this gap. It is based on a combination of theories about basic policy instruments (regulation, incentives and information) with realistic analysis focusing on mechanisms and context, and finally institutional theory proposing coercive, normative and mimetic mechanisms as explanations for organisational behaviour.

The model is applied to an intervention aimed at reduction of the risk of musculoskeletal disorders among bricklayers in Denmark. Our analysis of the case shows how various actors, including the authorities, employers, unions and bi-partite committees, developed a programme combining the policy instruments over a considerable period of time and that all three institutional mechanisms affected the outcome. This integration of various actors and instruments, which was not necessarily planned from the beginning, proved to be an effective way of facilitating the implementation of new preventive measures in bricklaying. The analysis also indicates new intermediary mechanisms, such as programme development, as an iterative process, and the importance of joint messages from employers and unions. The model thus provides new insights into the relationship between policy instruments and workplace health and safety outcomes.

1. Introduction

Evidence about risks in the working environment and the related health consequences has increased dramatically during the last decades. The knowledge about preventive measures and interventions have lacked behind among other due to methodological difficulties (Goldenhar et al., 2001) but the knowledge are in these years growing, among others supported by reviews (See examples in Bambra et al., 2007; Egan et al., 2007; Hale et al., 2010; Lehtola et al., 2008; Nielsen et al., 2010; Robson et al., 2007; Ruotsalainen et al., 2006; Tompa et al., 2007). However, knowing something does not necessarily imply that the knowledge is applied in practice, and the increased knowledge about risks and their prevention does not seem to have caused any considerable improvement of the working environment (Hämäläinen et al., 2009; Milczarek et al., 2009; Schneider et al., 2010).

It is therefore up to stakeholders in the society to transform evidence from research to operational policy instruments and subsequently secure that these instruments are applied in practice in firms. This transformation has since the early industrialisation been almost synonymous with state-organised labour inspection. Originally, labour inspection had a fairly narrow focus on just a few safety-related issues: for many years, child labour, accidents, risks from boilers and power transmissions, exposure to lead and noise were the typical problems covered. But since the 1970s, the field has broadened to cover many other aspects of work that might have detrimental effects on health and safety and, in a similar vein, preventive activities have grown to include many different instruments in the effort to improve the working environment. Since the Robens Report (1972), legislation has prescribed a general responsibility on employers, requiring a reasonable safe

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and sound working environment as a part of maintaining a general "license to operate". At the same time a large number of state regulators, professional bodies and social partners are now involved in the working environment agenda and they all aim to influence the companies. Finally, employers – or at least the larger companies in many countries – now generally consider a reasonable working environment a prerequisite for legitimacy among the organisation's stakeholders (Almqvist and Henningsson, 2009; Frick and Zwetsloot, 2007).

One track of research takes an interest in the function of societal policy instruments. This research is in particularly looking at compliance with state regulation of the working environment. The point of departure is usually state enforcement of mainly prohibitive rules for employers, and a lot of the literature focuses on legal issues such as how to distinguish between compliance and non-compliance (Amodu, 2008; Hutter, 1997). Recently, regulation research has started to move towards an understanding of employer motivation for compliance (Parker et al., 2011; Thornton et al., 2005), but the perspective is still on enforcement of the state's rules for employers.

This development leaves one particular gap in our knowledge: there is surprisingly little known about how evidence from research can be transformed into working environment interventions at the societal level which lead to practical improvements in the workplace (See among the few examples Cox et al., 2008; Mischke et al., 2013). Apart from providing information for general dissemination about for instance certain risks– which is obviously important – research also has to provide adequate answers on how to transform knowledge from research into workplace practice.

In this paper, we probe into the knowledge gap between the specific interventions to improve the working environment and the broader policies that are applied to govern the field. We discuss a possible theoretical framework which can support such a venture, and suggest a model as a point of departure for further research into the relationship between policies and workplace practice.

As theoretical stepping stones, we use Vedung's (1998) typology of policy instruments, the realistic understanding of mechanisms (Pawson and Tilley, 1997), and Scott's (2001) neo-institutional theory with its focus on the legitimacy of organisations. The framework is subsequently applied to a practical example of reducing heavy lifting and awkward work postures in bricklaying in Denmark. We complete the paper by discussing the implications for research in the domain between working environment policies and their practical application at workplace level.

2. Background

Research in the working environment is dominated by a biomedical research paradigm shaped by concurrent developments in epidemiology and the testing of drugs. Randomized control trials (RCTs) are considered the golden standard, and systematic Cochrane reviews are thought of as the ideal methodology to identify useful evidence (Verbeek et al., 2002). As intervention research focusing on the prevention of occupational diseases and accidents has evolved, the biomedical paradigm has followed suit. While this paradigm is without question necessary for medical research and useful for the identification of causal factors in occupational health, it is more problematic when used in intervention studies (Pawson, 2006; Pedersen et al., 2012). Intervention in the working environment cannot be compared to the testing of medicine. There are several important reasons why not. First, RCTs are based on a double-blind intervention: neither the researcher nor the patients know whether the active medicine or a placebo is being provided, whereas that will always be known to all the actors involved in working environment interventions. Second, most working environment interventions are aimed at organisational matters, such as particular work procedures, the use of technical equipment, the replacement of a certain technology or a chemical substance. None of these actions can be individually randomized. Third, working environment interventions take place in organisations in which the social actors react to the intervention and transform them to a greater or smaller extent depending on their interpretation of the intervention. Fourth, whereas the idea of RCTs is to control all confounding variables, working environment interventions take place in organisations which always exist in a unique context different from other organisations (see also Pawson (2006) for a broader discussion of RCT in social programmes).

This means that the rigorous methodological demands of Cochrane reviews make it difficult or in many cases almost impossible to identify organisational level interventions which work. The methodological demands will rule out most studies. In a review of 7522 studies of interventions for the prevention of injuries in construction, Lehtola et al. (2008) identified only five studies that met the Cochrane criteria (See also Pedersen et al., 2012). In a similar vein Mischke et al. (2013) could only include very few studies in their review of the effect of labour inspection. The point is that the Cochrane demands create an insurmountable barrier for useful research in preventive measures, because they cannot be randomized and contextual influence cannot be excluded. There is therefore a need for other kinds of intervention studies which can give the necessary evidence for preventive measures (Nilsen, 2007; Pedersen et al., 2012). We will come back to the discussion of such methods, but more importantly we will try to redirect research attention from the intervention *per se* and look at interventions as part of social programmes consisting of a number of different policies, regulations, enforcements and other attempts to change workplace practices.

As stated above, the regulation of the working environment has been seen as a matter for the state since the mid-nineteenth century. Rules have been issued and enforcement systems established to secure compliance. Evidence for the effect of the regulation system was traditionally not considered (See some of the few examples in Mischke et al., 2013; Viscusi, 1986). Working environment regulation was considered by the state as similar to any other regulative field. The regulation was put into place in order to secure social order, and if some risks seemed to get out of control, stricter rules and stronger enforcement would be the answer (Braithwaite and Drahos, 2000; Jacobsen, 2011).

Over the last thirty years, the development of society and the introduction of new public management (NPM) (Hood, 1995) have altered this picture. Nowadays, working environment regulation is increasingly subject to demands for accountability, transparency and efficiency just like any other public sector policy. This line of policy development focuses primarily on the efficient use of public resources and compliance and less on the actual effect on the working environment, even though that is the basic purpose of the enforcement strategies. One reason for this is the difficulty in establishing clear causal links between the authorities' enforcement strategies and any possible effects on health and safety outcome. The consequence is that policy effectiveness in NPM terms is measured through output proxies such as the number of inspected workplaces, the number of improvement notices, and the number of cases won in court.

Several attempts have been carried out to understand how rules and inspection may lead to improved compliance and thus to a healthier and safer workplace. For a recent overview, see May and Winter (2012), which can be interpreted as fairly pessimistic in relation to how far it is possible to develop generalizable knowledge on the effect of enforcement styles. Nevertheless, there is a need to get a better understanding of the process that turns

regulation and policy into an improved situation in the regulated organisation. The question is: What mechanisms can link policies to concrete workplace practices that actually improve the working environment?

An answer to this question implies moving beyond a focus on state regulation policy in order to understand these mechanisms. The state is no longer (if it ever was) the sole actor in enforcement of societal policies. A large number of other actors, from semi-governmental to independent civil society organisations, play an increasingly important role. For the working environment, the social partners (employers and unions) are key figures, but also important are bi- and tripartite bodies, professional organisations, certification agencies, educational institutions, researchers, local community groups, and the media. They all influence state policy and practice, they all have their own policies, and state regulations are formed in interaction with these actors. So we need to take these actors into account if we are to understand how working environment policies are transformed into actual workplace practice. One important consequence is a shift in perspective from the more limited study of the enforcement by state authorities to a study of the broader societal efforts to regulate the working environment.

The challenge is therefore to develop an understanding of what happens in the gap between knowledge about preventive strategies on the one hand and concrete workplace interventions on the other hand, and this is what we will do in the next section of the paper, where – as previously stated – we will develop an analytical framework based on a typology of policy instruments (Vedung, 1998), realistic evaluation with a focus on mechanism and context (Pawson, 2006; Pawson and Tilley, 1997), and a discussion of employer motivation to take action on improving the working environment based on institutional theory (DiMaggio and Powell, 1991; Greenwood et al., 2008; Scott, 2001).

3. Theoretical framework

3.1. Policy instruments

Our point of departure is the policy instruments available for the societal urge to influence the working environment in organisations[3]. Vedung (1998) has suggested a basic taxonomy of three state policy instruments: regulation, economic incentives, and information.

This division into the three basic policy instruments is derived from Vedung's analysis of the innumerable attempts by researchers to classify the means available to the state for changing any prevailing situation in society in a particular direction. Vedung argues that these instruments comprise all possible instruments. He refers to them with the metaphors: sticks, carrots and sermons. The metaphors illustrate the three different ways of motivating organisations to give priority to state policies: through enforcement (rules, inspection and prosecution), through benefits (incentives), or through normative knowledge (information). The three types of instruments represent an asymmetrical relationship between the regulator and the receiver of the regulation. The regulating parties have one or more of the following attributes: (1) power to establish the legal standards, (2) the ability to reallocate resources from the 'unworthy' to the 'worthy', and (3) the resources to launch an information campaign from those who have knowledge and insight to those who do not. We use this taxonomy of policy instruments in our analysis of the broader societal effort to achieve standards of health and safety, and of the ability of organisations to improve and maintain their own working environment.

Danish working environment legislation is based upon tripartite regulation and has increasingly developed a culture of negotiation, mediation and co-operation at an institutional level as well as an organisational level between the social partners themselves and between the social partners and the authorities (Sørensen et al., 2009). Other civil society institutions are also involved, and a Danish practice has evolved in which all three kinds of policy instruments are often applied to the same target group at the same time and with the same objective. The idea is that it is possible to create a synergy that will enhance the impact of the regulation. One example is the programme to reduce repetitive strain injuries, which included enforcement by the authorities, financial support for workplace changes, and extensive information activities. Moreover, it also included an agreement on reducing repetitive work between the employers and the unions (Hasle et al., 2004).

Such agreements are in line with the general "Danish model" for industrial relations (Due and Madsen, 2008), in which the social partners negotiate collective agreements on a wide range of issues – in recent decades, increasingly also on the working environment (Hasle and Petersen, 2004; Sørensen et al., 2009). Such agreements are not dominated by the state, but they often reflect state policy in some way, and in many cases are used to avoid government interference (Hasle et al., 2004; Hasle and Petersen, 2004). They are also backed by the possibility of sanctions in the labour courts and from the perspective of the individual organisation can therefore be seen as similar to state regulation.

In other cases, the social partners and other non-government organisations function in close connection or even in symbiosis with the state. That happens, for instance, in the case of bi- and tripartite bodies such as the Danish Working Environment Council and the sectorial working environment councils. On the one hand, they have relatively strong influence on state policy and thereby on the application of the three basic policy instruments, and on the other hand they work with interpretation and implementation of the state policy decided upon. In doing so, information about good practice, including warnings about the possible negative consequences of not controlling the risk, is the key tool. The information from the social partners in the councils is negotiated and therefore also constitutes a kind of semi-legal standard which may receive attention from employers and employees, because it expresses a joint opinion from both employer and employee organisations.

Certification of occupational health and safety management systems (OHSMSs) (BSI, 1999; Hasle and Zwetsloot, 2011; Robson et al., 2007; Zwetsloot et al., 2011a,b) is another example, in which non-government actors develop systems which gain semi-legal status and are more or less intertwined with the state. The state is involved in the development of standards at both national and international level and uses these standards, for instance, in the rationalisation of risk-based inspections. In Denmark, organisations with a certified OHSMS are relieved from regular inspections (Hohnen and Hasle, 2011) and certification is used as a substitute for inspection, for instance, of asbestos renovation in the Netherlands (Zwetsloot et al., 2011a, b). But the state has only limited control of the certifying mechanism, and the market plays an important role, which may reduce the effectiveness of the risk control (Zwetsloot et al., 2011a,b).

Vedung's (1998) three policy instruments, as mentioned above, have a basically asymmetrical nature, and it could be argued that a typology should also include more symmetrical instruments. But even the use of the term policy instruments implies that someone wants somebody to do something they are not already doing. Even in the case of the social partner agreements and the functioning of bi- and tripartite councils, there are still some societal actors who want to influence the behaviour of employers and employees. So

[3] We use the term organisation as a synonym for the terms company, firm and enterprise in order to cover both private and public workplaces.

although the state – powerful as it is – should be considered just one actor in society, we will continue to use the typology of the three policy instruments: regulation, incentives and information.

3.2. Institutional theory

The next question is: What makes organisations react to the application of policy instruments? The better we understand the motives for the reaction, the better we can develop our knowledge about the mechanisms which will make the policy instruments work in an efficient manner. Institutional theory can provide important insights into the organisational motives to react in certain ways to societal attempts to push the implementation of preventive occupational health and safety measures.

For the analysis in this paper we found organisational institutionalism particularly inspiring (DiMaggio and Powell, 1991; Greenwood et al., 2008). It is helpful in this context because it conceptualises organisational behaviour in a way that on the one hand suggests a fairly high level of patterned behaviour that allows for recognition, explanation and perhaps even an element of prediction, and on the other hand gives up the rationalism that tends to underlie most mainstream explanatory efforts in studies of regulation and the conduct of organisations.

Scott (2001) has provided us with a simple but useful map of where to look for institutional aspects of organisations. He suggests that institutions are built on three pillars: the regulative, the normative, and the cultural-cognitive. The *regulative pillar* deals with the explicit side of regulation: how we as a society set rules, monitor that they are obeyed, and how non-compliance is sanctioned. The *normative pillar* deals with what is right and wrong, not in legal terms but in social and moral terms. As it is, a lot of attention has been given to the normative aspect in recent research on regulation, in particular Kagan and Gunningham (2011). The authors raise the question as to why organisations generally comply with regulations when the chances of being caught for breaching the rules are slim and the sanctions are usually almost infinitesimal. Their answer is that they – or key actors within the organisations – feel obliged to do so. The *cultural-cognitive pillar* emphasises what is taken for granted: habits and practices based on neither rules nor norms, but on generally held beliefs of how things work around here. Roles are an important element in the cultural-cognitive pillar, because roles are pre-defined or pre-known positions in the social networks that constitute organisations and their exchange relations with the surrounding society.

DiMaggio and Powell (1991) use the same understanding in their introduction of the concept of isomorphism. They propose that a major driver for organisations is the need for legitimacy (Deephouse and Suchman, 2008; See also Suchman, 1995), and that isomorphism, or copying from other organisations, is the main way to achieve legitimacy. There are three forms of isomorphism: coercive, normative and mimetic which would be important motivators for occupational health and safety measures in an organisation. In the first case, an organisation may experience outside pressure as a way of forcing implementation of particular measures; in the second case, the organisation follows the norms observed among stakeholders; and in the third case, the organisation does what everybody else seems to be doing. These three forms of isomorphism are useful for our further analysis of the reasons for organisations to act on societal working environment interventions.

3.3. Realist analysis

We now have on the one side a set of policy instruments which are available for state and civil society actors and on the other side a basic understanding of the motives for organisations to react to policy instruments, and in addition knowledge is available from intervention research on measures which could be beneficial for the working environment. The next step is to find ways to analyse the relationship between those two sides. Realist analysis can provide a stepping stone for the development of an analytical framework (Pawson, 2006; Pawson and Tilley, 1997; Pedersen et al., 2012). As indicated in the critical reflections on RCT intervention research and Cochrane reviews, context-free causal relations do not exist in social programmes in society and reactions to programme interventions are therefore not arbitrary. The reactions follow certain logics and rules which depend on the context (Dyhrberg and Jensen, 2004) but also have similarities from case to case. Pawson and Tilley (1997) suggest that this similarity can be understood as the interaction between mechanisms and context. Mechanisms can be defined as:

> *"... the engines of explanation in realist analysis. We can make rough sense of the world through its demi-regularities. The rhythms and associations of natural and even social systems are constant enough that we can navigate our way through them, although, as just argued, we are never particularly surprised when things don't work out as expected. We rely on mechanisms to tell us why interconnections should occur. A sequence of events or a pattern of behaviour are explained as being part of a system and the mechanism tells us what it is about that system that generates the uniformity. Mechanisms explain causal relations by describing the 'powers' inherent in a system, be those systems substances like gases and gunpowder) or agents (like examiners or policy-makers) or structures (like bureaucracies or social programmes). In all cases it is something about the 'propensity' of the system that explains the causal regularities. The mechanism explains what it is about the system that makes things happen."* (Pawson., 2006, p. 23)

Mechanisms play out in a certain context – a specific organisation in a specific sector in a specific country – which will influence what the end result will be. In some cases, the context facilitates that the mechanisms may lead to the expected outcome of a programme; in others, the outcome will be quite different, and in yet others, there may be no outcome. That is why mechanisms produce semi-regularities rather than regularities. The situation is easily recognisable from how policy instruments influence the working environment field. For any specific rule, there will be a number of organisations that comply with the rule, others that will do a variety of other things which they may consider relevant but are far from the intentions of the policy makers, and yet others will do almost nothing. For each of these reactions, the context of the organisation is likely to explain a large share of the difference in outcome. Some organisations may have a strategy of maintaining a high level of compliance, and therefore employ dedicated health and safety professionals who ensure the practical implementation of the rule, whereas others may be struggling for the survival of the business with no time for concern about working environment rules, or they may just do the same as everybody else. Thus, context includes both internal (structural and cultural) matters as well as external conditions, such as the market, stakeholders, and sector characteristics.

The focus for realist analysis is to learn how a social programme works, for whom and under what circumstances (Pawson and Tilley, 1997). In this way, realist analysis offers a potential framework for the analysis of the gap between working environment policies and the outcome in terms of changed workplace practices. By uncovering the mechanisms which make some organisations willing to improve the working environment and others abstain, we can set up programme theories (Rogers, 2008) for the function of working environment policy instruments (Olsen et al., 2012) which

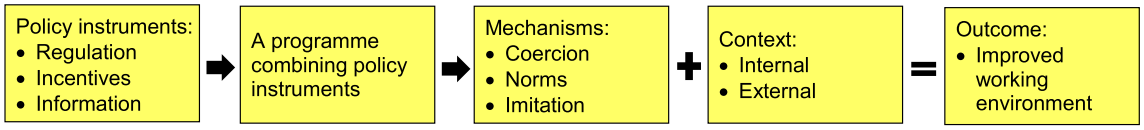

Fig. 1. A model for the relationship between policy instruments and working environment outcome.

can be used to optimise the effect of the policies and subsequently allow for the evaluation of the outcome and further optimisation.

3.4. A model for the relationship between policy instruments and working environment outcome

By combining the three theoretical approaches, we can now suggest a simple model which can outline the relationship between the societal efforts to improve the working environment on the one hand, and the outcome of the measures in organisations on the other hand. Vedung's typology provides the policy instruments, realistic evaluation contributes programme theory, mechanisms and context, and institutional theory gives us a first approximation of the generic mechanisms behind the organisational changes which are supposed to improve the working environment.

The logic is that state and civil society actors develop a programme which combines the policy instruments into a specific blend which the actors believe will achieve the political goals. We use the term programme, but it does not need to be a cohesive or explicit programme jointly developed by all relevant actors. It can also be developed over time as different actors add more activities to the programme, but for the organisations it will be experienced as various elements aimed at the same goal – some specific action to improve the working environment. The organisations' reactions to the programme are formed by a combination of context and mechanisms with elements of coercion, norms and imitation. Mechanisms and context together have an impact on the outcome in terms of improvements (or otherwise) in the working environment (see Fig. 1).

4. Application of the model to bricklaying

To demonstrate the applicability of the model, we provide an analysis of a concrete example from the construction industry. It is the story of an extended process lasting approximately ten years, and it illustrates how a programme emerges, utilising all three policy instruments, and how it can lead to positive changes in the workplaces. The case analysis is based on data from the evaluation of the programme (Mathiesen and Pedersen, 2010).

The case started in the late nineties when the bipartite Working Environment Council for the Construction Sector (WEC-Construction)[4] funded a research report which concluded that bricklayers had a high risk of musculoskeletal disorders (MSD) (Nielsen and Mølgaard, 2002). The risk was especially related to bricklaying from scaffolding. The report proposed a reduction in the height of each bricklaying sequence before elevating the scaffold from one and a half metres to one metre. This would avoid the most damaging work postures. At the same time, the inspectors from the Working Environment Authority started to give improvement notices to construction companies, requiring them to reduce the MSD risk for bricklayers. WEC-Construction took up the case and argued that time was needed to develop the necessary technical solutions. The authorities agreed and put their inspection activities on hold, awaiting a solution created by the Council.

WEC-Construction subsequently embarked on a process to solve the problem. It was far from a simple task to implement preventive measures in a very tradition-oriented sector. The process included two main steps. The first was to develop new tools and bricklaying methods, and the second to introduce the new measures to the companies in the sector. An important prerequisite was that the brick suppliers had to change their pallets from containing 115 bricks to 80, which involved changes in pallets and in their production layout. A number of technical aids had to be developed, including new brick trolleys and modified scaffolds. Changes in the work organisation were also necessary, because the collective agreement on piecework encouraged the traditional way of bricklaying.

WEC-Construction initiated projects that could develop the technical aids and encouraged the brickworks to develop and provide the 80-brick pallets. Pilot tests in bricklaying companies were funded by the Danish Prevention Fund, which gives financial support to working environment projects. An important element was to create comprehensive guidelines for both employers and bricklayers. These explained in detail how the one-metre bricklaying should be carried out and the measures that were necessary to introduce the method. The guidelines were developed in cooperation between the employers' association and the unions. Reaching an agreement took time, but eventually they succeeded, and employers and unions started to inform and instruct their respective members through dissemination of the written guidelines, developing internet-based instructions, information meetings and dissemination through other media.

The employers' association were motivated by the pressure from the Working Environment Authority to enforce improvements in their member companies. Regulation and the threat of enforcement was therefore an important driver. The Labour Inspectorate for its part took the newly developed guidelines as the point of departure for restarting the inspections and issuing specific legal improvement notices to the companies on the construction sites.

The unions, of course, were motivated by the possibility of improving conditions for their members. Nevertheless, they were forced to put a lot of effort into the information campaign, because not all bricklayers found the way of working beneficial. Furthermore, there was a rather unfortunate consequence in the way the new method increased the heavy lifting of the bricklayer's unskilled labourers as they carried bricks to the scaffold. Attention to their working conditions therefore also became urgent during the process, and a number of additional measures were developed.

The evaluation of the programme (Mathiesen and Pedersen, 2010) indicates a number of important results:

- Almost all employers and bricklayers in the sector had knowledge about the new methods and they were acquainted with the guidelines.
- There was a widespread acceptance of the new methods.
- A substantial proportion of the companies visited actually worked in accordance with the method, either fully or at least to some extent.

[4] The legislation in Denmark has stipulated the establishment of 11 bi-partite sector specific working environment councils. They get a certain basic funding from the state, and their main objective is to develop and disseminate information, including guidance on best practice.

4.1. Policy instruments and mechanisms in the bricklaying case

The case can be used to highlight several points relevant for our search for the links between policy instruments and changes in the working environment. First of all, the process of creating a new standard for bricklaying seems to have been important for the outcome in the workplaces. WEC-Construction was originally established as an institution linked to the 'information' policy instrument, but when we look at the whole process, it is clear that the Council successfully integrated elements of the two other instruments: regulation and incentives. They used the initial pressure from inspections as a stepping stone for the joint employer-union project, and they utilised the economic incentives provided by the state to secure funding for the crucial development and practical testing of the new technical solutions. The bricklaying case therefore shows how the three policy instruments can be combined:

- Regulation: Initial pressure on the sector from labour inspectors issuing concrete improvement notices, acceptance of a halt to inspections as technical solutions were developed, and subsequently the use of the WEC-Construction guidelines as the new standard for inspection practices.
- Incentives: Economic support from the Prevention Fund to develop technical solutions and for practical testing.
- Information: Guidelines with detailed instructions from WEC-Construction were disseminated through a number of platforms and, most importantly, actively promoted by both employers' associations and unions.

This specific blend constitutes what with hindsight we can call the programme to prevent MSD among bricklayers, and it illustrates how the policy instruments have a very concrete and specific configuration in which each element enhances the others and creates synergy which increases the chance of a successful outcome.

Another important point is related to the way the programme came about. The key actors were the employers, the unions and WEC-Construction, with the authorities playing an important role in creating the initial pressure, but subsequently maintaining a rather low profile. These roles illustrate the move from state control to the network governance model, in which several actors – civil society as well as state actors – all have important roles, and in this case the civil society actors even played the leading roles, although the initial enforcement was a prerequisite for the agreement between employers and unions.

A change in employer-union relations on the issue of the working environment paved the road for these new roles. From the 70s until the late 90s, the working environment was a conflict issue with little cooperation, and both parties tended to put pressure on the state to get their political viewpoints implemented. This situation has slowly changed over the last 15 years. The two parties have gradually moved towards closer cooperation in the realisation that they thus gain two advantages: (1) Agreement between the two parties allows them to have a stronger influence on state regulation, and (2) their members (employers and employees) no longer receive confusing and contradictory signals about what to do and not to do. Each side has its reasons for this shift of position. The employers realised that they would have a stronger hand in the resulting concrete regulation if they played a positive role rather than just opposing new regulation, and at the same time they could see greater interest in the working environment among their members – at least in the bigger organisations. The unions could see the difficulties in the practical implementation of working environment policies when they were firmly opposed by the employers, and they also experienced a more cooperative attitude among their members in the workplace (Hasle and Petersen, 2004; for further discussion of this development see Sørensen et al., 2009).

If we turn to the perspective of the bricklaying companies, we can identify elements of the three main drivers (mechanisms) for organisational adaptation:

- Coercive: The employers would have experienced the initial improvement notices from inspectors as coercion, and at a time with limited compliance possibilities because the technical solutions were not available. By the end of the process, coercion was prevalent again as the inspectors applied the new solutions as the standard for bricklaying.
- Normative: The unanimous message from the employers' associations and unions about both the necessity and the advantages of using the new technical solutions played an important role in the development of new norms in the sector. The recommendation from their own employer association confirmed that application of the technical solutions was the ethically correct thing to do.
- Mimetic: As employers and bricklayers started to see examples of others applying the methods, they found it more convincing to apply the methods themselves.

In real life, the three drivers cannot be separated. For each of the employers, elements from all three drivers probably played a role. Pressure from the authorities, the evolving norms in the sector, and the observation of others were all important.

5. Perspectives

Our aim with this paper was to find ways to bridge the gap between policy instruments and practice in the workplaces. Our suggestion is a model which combines Vedung's typology of policy instruments, realistic evaluation's mechanisms and context, and institutional theory's isomorphism as a means to achieve organisational legitimacy. The application of this model to the bricklayer case shows that this understanding of the bridge between policy and practice provides useful knowledge. Generalising the results of the case, we can further suggest a number of important causal relations (or demi-regularities, as Pawson and Tilley (1997) call them). The most important ones are:

- An intervention programme is iterative. The actors rarely have a fully-fledged plan with a developed programme theory.
- The policy instruments are more efficient when they are applied in combination and closely aligned to the context of the target group.
- The state as represented by the working environment authorities does not have the power to enforce successful implementation of preventive measure on its own. However, enforcement, or the threat of possible enforcement activities, is an important motivating factor for the social partners to enter into agreements and for employers to utilise information material and training opportunities provided by the social partners and other civil society actors.
- Collaboration and joint messages from the social partners are important for the acceptance of new preventive measures in the target group.

It may not, of course, always work as suggested above, but that is just what Pawson and Tilley (1997) point out. There are no natural laws in social science, but on the other hand organisational changes are not stochastic events either. There are half-regularities where there is a reasonably good chance that the reactions can be predicted to some extent. However, more analysis of half-regularities is necessary to be more certain about what works and what

does not work. Pawson (2006) suggests carrying out realistic reviews where several studies of the same issues are included in the analysis in order to get a more valid understanding of the mechanism. We have demonstrated the potential of this approach in our analysis of just one case, and similar analyses of cases in other sectors or in relation to other risks will probably provide new insights into the possibilities.

It is of particular importance to note that we have chosen a relatively positive case in which employers and unions were able to co-operate and were successful in influencing workplaces. It might be relevant to study cases where employers and unions have strong conflicting interests and the state has to play a bigger role in enforcement (or perhaps abstain from doing anything). But even in such cases it will be valuable to search for the mechanisms and contexts that hinder a successful outcome.

Another important issue might be Vedung's typology. It is based on rather strongly asymmetrical relationships – the state wants citizens to act in certain predefined ways. Network society relations are perhaps more symmetrical and there could therefore be other instruments in place. Agreements or covenants within a sector or networks might be one such a possibility.

For practice the conceptual model opens for an understanding of the processes health and safety professionals are participating in – whether they are advising or inspecting workplaces or they are involved in the development of new working environment programmes.

For research the model can help to understand how new evidence about interventions can be transformed into programmes which can lead to a broader impact of the intervention knowledge. It is at the same time a conceptual model, and it is therefore also calling for more both theoretical and empirical studies that utilise the model and therefore both test its applicability and provide new important knowledge about the mechanisms that can lead to efficient interventions which improve health and safety at the workplaces.

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References

Almqvist, R., Henningsson, J., 2009. When capital market actors reduce the complexity of corporate personnel and work environment information. J. Hum. Resour. Cost. Account. 13 (1), 46–60.

Amodu, T., 2008. The Determinants of Compliance With Laws and Regulations with Special Reference to Health and Safety – A Literature Review. HSE Books, London.

Bambra, C., Egan, M., Thomas, S., Petticrew, M., Whitehead, M., 2007. The psychosocial and health effects of workplace reorganisation. 2. A systematic review of task restructuring interventions. J. Epidemiol. Community Health 61 (12), 1028–1037.

Braithwaite, J., Drahos, P., 2000. Global Business Regulation. Cambridge University Press.

BSI (1999), Occupational Health and Safety Management Systems, British Standard Institution, OHSAS 18001.

Cox, A., O'Regan, S., Denvir, A., Broughton, A., Pearmain, D., Tyers, C., Hillage, J., 2008. What Works in Delivering Improved Health and Safety Outcomes. University of Sussex, Brighton.

Deephouse, D.L., Suchman, M.C., 2008. Legitimacy in organizational institutionalism. In: Greenwood, R., Suddaby, R., Sahlin-Andersson, K. (Eds.), The SAGE Handbook of Organizational Institutionalism. Sage Publications, Thousand Oaks, CA, pp. 9–77.

DiMaggio, P.J., Powell, W.W., 1991. The iron cage revisited: institutional isomorphism and collective rationality in organizational fields. In: Powell, W.W., DiMaggio, P.J. (Eds.), The New Institutionalism in Organizational Analysis. The University of Chicago Press, Chicago, pp. 3–82.

Due, J., Madsen, J.S., 2008. the danish model of industrial relations: erosion or renewal? J. Ind. Relat. 50 (3), 513–529.

Dyhrberg, M.B., Jensen, P.L., 2004. Organizations in context: proposal for a new theoretical approach in prescriptive accident research. Safety Sci. 42 (10), 961–977.

Egan, M., Bambra, C., Thomas, S., Petticrew, M., Whitehead, M., Thomson, H., 2007. The psychosocial and health effects of workplace reorganisation. 1. A systematic review of organisational-level interventions that aim to increase employee control. J. Epidemiol. Community Health 61 (11), 945–954.

Frick, K., Zwetsloot, G.I.J.M., 2007. From safety management to corporate citizenship: an overview of approaches to managing health. In: Johansson, U., Ahonen, G., Roslender, R. (Eds.), Work Health and Management Control. Thomson Fakta, Stockholm, pp. 9–134.

Goldenhar, J.M., LaMontagne, A.D., Katz, T., Heaney, C., Landsbergis, P.A., 2001. The intervention research process in occupational safety and health: an overview from the national occupational research agenda intervention effectiveness research team. J. Occup. Environ. Med. 43, 616–622.

Greenwood, R., Oliver, C., Suddaby, R., Sahlin-Andersson, K., 2008. The Sage Handbook of Organizational Institutionalism. Sage, Thousand Oaks, CA.

Hale, A.R., Guldenmund, F.W., van Loenhout, P.L.C.H., Oh, J.I.H., 2010. Evaluating safety management and culture interventions to improve safety: effective intervention strategies. Safety Sci. 48 (8), 1026–1035.

Hämäläinen, P., Leena, S.K., Takala, J., 2009. Global trend according to estimated number of occupational accidents and fatal work-related diseases at region and country level. J. Safety Res. 40 (2), 125–139.

Hasle, P., Hansen, N.J., Møller, N., 2004. Agreements between labour unions and employers' associations as a strategy for the prevention of repetitive strain injury. Econ. Ind. Democracy 25 (1), 75–101.

Hasle, P., Petersen, J., 2004. The role of agreements between labour unions and employers in the regulation of the work environment. Policy Pract. Health Safety 2 (1), 5–22.

Hasle, P., Zwetsloot, G.I.J.M., 2011. Editorial: occupational health and safety management systems: issues and challenges. Safety Sci. 49 (7), 961–963.

Hohnen, P., Hasle, P., 2011. Making work environment auditable – a 'critical case' study of certified occupational health and safety management systems in Denmark. Safety Sci. 49 (7), 1022–1029.

Hood, C., 1995. The "new public management" in the 1980s – variations on a theme. Acc. Organ. Soc. 20 (2–3), 93–109.

Hutter, B.M., 1997. Compliance – Regulation and Environment. Clarendon Press, Oxford.

Jacobsen, K., 2011. Velfærdens pris: Arbejderbeskyttelse og arbejdsmiljø gennem 150 år. Gad.

Kagan, R.A., Gunningham, N.A., Thornton, D., 2011. Fear, duty, and regulatory compliance: lessons from three research projects. In: Parker, C., Nielsen, V.L. (Eds.), Explaining Compliance – Business Responses to Regulation. Edward Elgar, Cheltenham, pp. 7–58.

Lehtola, M.M., van der Molen, H.F., Lappalainen, J., Hoonakker, P.L., Hsiao, H., Haslam, R.A., Hale, A.R., Verbeek, J.H., 2008. The effectiveness of interventions for preventing injuries in the construction industry – a systematic review. Am. J. Prev. Med. 35 (1), 77–85.

Mathiesen, T.G., Pedersen, F., 2010. Evaluering af vejledninger om opmuringsarbejde, Teamarbejdsliv, Copenhagen.

May, P.J., Winter, S.C., 2012. Regulatory enforcement styles and compliance. In: Parker, C., Nielsen, V.L., (Eds.). Edward Elgar Publishing, Cheltenham, pp. 222–224.

Milczarek, M., Schneider, E., Gonzalez, E.R., 2009. OSH in figures: stress at work — facts and fi gures, European Agency for Safety and Health at Work, Luxembourg.

Mischke, C., Verbeek, J.H., Job, J., Morata, T.C., Alvesalo-Kuusi, A., Neuvonen, K., Clarke, S., Pedlow, R.I. 2013. Occupational safety and health enforcement tools for preventing occupational diseases and injuries. Cochrane Database of Systematic Reviews(8).

Nielsen, K., Mølgaard, H., 2002. Projekt arbejdsmiljøforbedringer ved opmuring og stilladsarbejde, BST Danmark A/S, Copenhagen.

Nielsen, K., Taris, T.W., Cox, T., 2010. The future of organizational interventions: addressing the challenges of today's organizations. Work Stress 24 (3), 219–233.

Nilsen, P., 2007. The how and why of community-based injury prevention – a conceptual and evaluation model. Safety Sci. 45 (4), 501–521.

Olsen, K., Legg, S., Hasle, P., 2012. How to use programme theory to evaluate the effectiveness of schemes designed to improve the work environment in small businesses. Work: J. Prevent. Assess. Rehabil. 41 (0), 5999–6006.

Parker, C., Nielsen, V.L. (Eds.), 2011. Explaining Compliance – Business Responses to Regulation. Edward Elgar, Cheltenham.

Pawson, R., 2006. Evidence-based Policy: A Realist Perspective. Sage.

Pawson, R., Tilley, N., 1997. Realistic Evaluation. Sage, Los Angeles, London, New Delhi, Singapore, Washington DC.

Pedersen, L.M., Nielsen, K.J., Kines, P., 2012. Realistic evaluation as a new way to design and evaluate occupational safety interventions. Safety Sci. 50 (1), 48–54.

Robens, L.A., 1972. Report of the Committee of Inquiry into Safety and Health at Work, HMSO, London, Cmnd, 5034

Robson, L.S., Clarke, J., Cullen, K., Bielecky, A., Severin, C., Bigelow, P.L., Irvin, E., Culyer, A., Mahood, Q., 2007. The effectiveness of occupational health and safety management systems: a systematic review. Safety Sci. 45, 329–353.

Rogers, P.J., 2008. Using programme theory to evaluate complicated and complex aspects of interventions. Evaluation 14 (1), 29–48.

Ruotsalainen, J., Verbeek, J.H., Salmi, J.A., Jauhiainen, M., Laamanen, I., Pasternack, I., Husman, K., 2006. Evidence on the effectiveness of occupational health interventions. Am. J. Ind. Med. 49 (10), 865–872.

Schneider, E., Irastorza, X., Verjans, M., 2010. OSH in figures: work-related musculoskeletal disorders in the EU—Facts and figures, European Agency for Safety and Health at Work, Luxembourg.

Scott, W.R., 2001. Institutions and Organizations, 2 edn. Sage Publications.
Sørensen, O.H., Hasle, P., Navrbjerg, S.E., 2009. Local agreements as an instrument for improvement of management-employee collaboration on occupational health and safety. Econ. Ind. Democracy 30 (4), 643–672.
Suchman, M.C., 1995. Managing legitimacy – strategic and institutional approaches. Acad. Manag. Rev. 20 (3), 571–610.
Thornton, D., Gunningham, N.A., Kagan, R.A., 2005. General deterrence and corporate environmental behavior*. Law Policy 27 (2), 262–288.
Tompa, E., Trevithick, S., McLeod, C., 2007. Systematic review of the prevention mechanisms for occupational incentives of insurance and regulatory health and safety. Scand. J. Work Environ. Health 33 (2), 85–95.
Vedung, E., 1998. Policy instruments: typologies and theories. In: Bemelmans-Videc, M.-L., Rist, R.C., Vedung, E. (Eds.), Carrots Sticks & Sermons – Policy Instruments and their Evaluation. Transaction Publishers, New Brunswick, NJ, pp. 1–58.
Verbeek, J.H., van Dijk, F.J.H., Malmivaara, A., Hulshof, C.T., Räsänen, K., Kankaanpää, E.E., Mukala, K., 2002. Evidence-based medicine for occupational health. Scand. J. Work Environ. Health 28 (3), 197–204.
Viscusi, W.K., 1986. The impact of occupational safety and health regulation, 1973–1983. Rand J. Econ. 17 (4), 567–580.
Zwetsloot, G.I.J.M., Hale, A.R., Zwanikken, S., 2011a. Regulatory risk control through mandatory occupational safety and health (OSH) certification and testing regimes (CTRs). Safety Sci. 49 (7), 995–1006.
Zwetsloot, G.I.J.M., Zwanikken, S., Hale, A.R., 2011b. Policy expectations and the use of market mechanisms for regulatory OSH certification and testing regimes. Safety Sci. 49 (7), 1007–1013.